PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
Leonard W. HELMER, Jr. et al.)
)
Application No.: 10/692,496)
Confirmation No.: 1872)
Group Art Unit: 2157)
Filed: October 24, 2003)
Examiner: Barbara N. BURGESS)
For: SPECULATIVE METHOD AND)
SYSTEM FOR RAPID DATA
COMMUNICATIONS)
)

APPEAL BRIEF

MS-APPEAL BRIEF-PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Appeal Brief is filed in response to a Final Office Action dated April 21, 2008, followed by a Notice of Appeal with Pre-Appeal Conference Request Brief filed July 18, 2008, and a Notice of Panel Decision from Pre-Appeal Brief Review dated August 20, 2008. Reconsideration of the Application, withdrawal of the rejections, and allowance of the claims are respectfully requested.

CERTIFICATE OF TRANSMISSION

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ON: November 20, 2008 BY: Jeffrey N. Giunta

SIGNATURE: /Jeffrey N. Giunta/

I. REAL PARTY IN INTEREST

The real party in interest is International Business Machines (IBM) of Armonk, NY.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

III. STATUS OF CLAIMS

Claims 1-5, 7-12, 14-18 and 20-22 are pending.

Claims 1-5, 7-12, 14-18 and 20-22 are rejected.

The Appellant is appealing the rejection of independent claim 1 and the rejection of dependent claims 2, 3, and 7.

IV. STATUS OF AMENDMENTS

The Examiner issued a final rejection of claims 1-5, 7-12, 14-18 and 20-22 in the Final Office Action of April 21, 2008. No amendments have been submitted after the final rejection.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

This summary references paragraph numbers of the publication of the subject application, U. S. Patent Application Publication 20050091390, April 28, 2005. Page and line numbers refer to the subject patent application as filed.

Independent Method Claim 1 sets forth the following subject matter:

A) identifying a pre-defined destination node, the pre-defined destination node being within a plurality of remote computer nodes to which data packets are able to be sent over a data communications network. This aspect of the presently claimed invention is described in the specification at, for example, paragraph 0042 (page 18, lines 8-14).

B) queuing, in an expedited transmission queue that is separate from a normal data packet queue, a first data packet that is addressed to the pre-defined destination node, wherein the normal data packet queue is used to queue data packets for transmission to other computing systems within the plurality of remote computer nodes, the other computing systems comprising destination nodes that are not the pre-defined destination node. This aspect of the presently claimed invention is described in the specification at, for example, FIG. 3, elements 308, 310 and 312, and paragraph 0035 (page 12, lines 17 through page 13, line 2), and FIG. 6, step 604, and paragraphs 0045 (page 18, lines 7-12)

C) sending, through a communications adapter, the first data packet to the pre-defined destination node. This aspect of the presently claimed invention is described in the specification at, for example, paragraph 0044 (Page 18, lines 3-4); FIG. 9, element 926, paragraph 0052 (page 22, lines 21-22).

D) loading a packet descriptor associated with a second data packet into the communications adapter, wherein the loading is concurrent with the sending and the packet descriptor identifies a second destination node that is the pre-defined destination node. This aspect of the presently claimed invention is described in the specification at, for example, paragraph 0044 (Page 18, lines 2-6); FIG. 6, steps 606, 614

E) transferring, in dependence upon the packet descriptor, the second data packet to the second destination node over the data communications network. This aspect of the presently claimed invention is described in the specification at, for example, paragraph 0046 (page 19, lines 3-5); FIG. 9, element 926.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether independent claim 1 and dependent claim 2 are unpatentable over *Goldenberg et al.* (U. S. Patent Publication Number 2004/0034718) in view of *Minnick et al.* (U. S. Patent Publication Number 2003/0058878).

Whether dependent claims 3 and 7 are unpatentable over *Goldenberg et al.* (U. S. Patent Publication Number 2004/0034718) in view of *Minnick et al.* (U. S. Patent Publication Number 2003/0058878) and in view of *Snyder et al.* (U. S. Patent Number 5,522,039).

VII. ARGUMENT

A. Whether claims 1 and 2 are unpatentable over Goldenberg et al. in view of Minnick et al.

In the Examiner's Office Action of April 21, 2008, the Examiner rejected independent claim 1 and dependent claim 2 as being unpatentable over *Goldenberg et al.* (U. S. Patent Publication Number 2004/0034718) (Hereinafter "Goldenberg") in view of *Minnick et al.* (U. S. Patent Publication Number 2003/0058878) (Hereinafter "Minnick"). The Appellants respectfully submit that claims 1 and 2 are not unpatentable over these references.

<u>Rejection of Independent Claim 1</u>

The Appellants assert that the rejection of claim 1 over Goldenberg and Minnick was improper for at least three reasons.

1) The Examiner failed to cite a teaching of "a second destination node that is the pre-defined destination node" within the context of claim 1 when considered "as a whole,"
2) The Examiner is improperly citing a transferring of sending received data packets to system memory as a teaching of sending transmitted data packets from one computer node to another destination computer node, and

3) The combination of Goldenberg and Minnick, as asserted by the Examiner, would lead to an inoperable system.

The Appellants assert that Goldenberg fails to inherently teach or even make obvious “a second destination node that is the pre-defined destination node” due to the inoperability of such a modification of the Goldenberg system. The inoperability of the Examiner’s proposed modification also precludes any argument of effectively applying the receive packet processing cited by the Examiner to the transmit packet processing of the presently claimed invention. These bases for reversing the rejection of claim 1 are discussed below.

The relevant limitations of claim 1 include the “sending,” “loading,” and the “transferring” limitations of independent claim 1. These limitations recite:

> sending, through a communications adapter, the first data packet to the pre-defined destination node
> loading a packet descriptor associated with a second data packet into the communications adapter, wherein the loading is concurrent with the sending and the packet descriptor identifies <u>a second destination node that is the pre-defined destination node</u>;
> transferring, in dependence upon the packet descriptor, the second data packet to the second destination node over the data communications network.

The “loading” limitation defines the “second destination node” to be the same node as the “pre-defined destination node” of the “sending” limitation. The “loading limitation further specifies that a “packet descriptor” identifying “a second destination node,” which is defined to be identical to the “pre-defined destination node” of the “sending” limitation, is loaded into the communications adapter “concurrent with the sending.”

The Appellants point out that these limitations, when considering the claimed invention “as a whole,” specifies a method that sends two data packets, “a first data packet” and “a second data packet,” to <u>the same destination computer node</u>, where the

destination of the second data packet is loaded into the communications adapter concurrent with the sending of the first data packet to the <u>same destination computer node</u>. The fact that these "destination computer nodes" are not memory locations, as analogized by the Examiner, is clear by the specification of the "identifying" limitation of claim 1, which explicitly states that "the predefined destination node" is "within a plurality of remote computer nodes to which data packets are able to be sent over a data communications network.

In contrast to the process of sending two packets to the same destination computer node over a network, the Examiner cites teachings of processing that copies data received over a network <u>from a remote computer</u> through a network adapter <u>to</u> local <u>memory buffers</u> of a receiving computer. Office Action dated April 21, 2008, page 2, last paragraph through page 3, bottom, citing Goldenberg, paragraphs 0009, 0010, 0013, 0015, 0019, 0045, 0047 and 0049]. The Appellants assert that reversing the data flow of the Goldenberg teachings cannot provide a proper teaching of the "sending" and "transferring" limitations of claim 1, particularly in the context of the other claim limitations. The Examiner is analogizing the <u>transferring of data to memory</u> of Goldberg to "<u>sending</u> the first data packet to the pre-defined <u>destination node</u>" of claim 1, which is clearly erroneous in the context of the other claim limitations.

The Appellants point out that the Goldenberg reference is directed to "prefetching of receive queue descriptors" to perform the transfer of data <u>from</u> a network adapter <u>to computer system memory</u> when the network adapter has received that data. Goldenberg, Title and paragraphs 0009-0010. The Appellants point out that although the Goldenberg reference describes loading descriptors before the data to be transferred is received, the Goldenberg reference does not teach or suggest that the <u>multiple</u> data packets are transferred <u>to the same destination</u>, which is explicitly defined by claim 1 as "the pre-defined destination node." In particular, the "sending" limitation specifies that "the first data packet" is sent "to the pre-defined destination node" and that the "packet descriptor" of the "loading" limitation also "identifies a second destination node <u>that is the pre-defined destination node</u>."

The Appellants assert that the method and system defined by Goldenberg are materially different from the method set forth by independent claim 1 and cannot support the successive transferring of data packets to the same destination.

The Appellants assert that performing the operations as defined by claim 1 with the system described by the Goldenberg reference would create to an inoperable system since the data in the system memory that was first written by the communications adaptor would be quickly overwritten by the next received data packet. A practitioner of ordinary skill in the art would recognize that the concurrent loading of a second packet's destination memory address that is the same as the first packet's destination memory address while transferring the first packet makes it highly likely that the first data set written to system memory by Goldenberg would be overwritten before the computer processor has finished processing that first data set. The "loading" limitation specifies that the "destination" of the second packet is loaded into the communications adapter "concurrent with the sending [of the first data packet]." The Appellants assert that due to these inoperability considerations, a practitioner of ordinary skill in the art would not consider combining the teachings of Goldenberg with the teachings of Minnick, as is asserted by the Examiner.

In the process of <u>sending</u> data packets to computer nodes, such as is defined by claim 1, data is clearly not "overwritten." Such practical differences between the system cache to system memory transfers of Goldenberg and the data communications network transfers of the presently claimed invention clearly preclude using Goldberg as a teaching of the "sending" and "transferring" limitations of claim 1.

<u>Rejection of Claim 1 fails to cite "a second destination node that is the pre-defined destination node"</u>

The Appellants assert that the Examiner as failed to cite a teaching of "a second destination node that is the pre-defined destination node" where this same destination node is specified as the destination for two successive data packets, as is set forth

within the context of Claim 1, when considered "as a whole." The Examiner cites teachings of Goldenberg that teach loading system memory destinations to receive data packets that are received over a data network. Office Action dated April 21. 2008, page 3, first paragraph, citing Goldenberg, paragraphs [0008-0010, 0017, 0019, 0045]. The Appellants fail to find any teaching of "a second destination node that is the pre-defined destination node," particularly within the context of the presently claimed invention.

The Appellants further assert that, due to the inoperability concerns discussed below, a practitioner of ordinary skill in the art would recognize that using identical system memory destinations for sequentially received data packets would lead to an inoperable system. The Appellants therefore assert that extending or modifying the Goldenberg reference to include "a second destination node that is the pre-defined destination node," is not "within the grasp of one of ordinary skill in the art" since an inoperable system would result.

<u>Rejection of Claim 2</u>

The Appellants assert that the cited references fail to teach "the fast data queue <u>only queues data packets</u> for transmission to <u>the pre-defined destination node</u>." As discussed above, claim 1, from which claim 2 depends, clearly defines "the pre-defined destination node" to be a single destination node to which multiple data packets are sent. Claim 1 further defines that the "expedited transmission queue," which is specified in claim 2 to comprise the "fast data queue," is separate from a normal data packet queue."

The Examiner cites a portion of Minnick that discloses a plurality of queues wherein packets with MAC addresses (which are numbers that uniquely correspond to the individual destination nodes) that <u>end in</u> the same bit pattern are placed into the same queue within a group of queues. Office Action, dated April 21, 2008, page 5, first paragraph, citing Minnick, paragraphs [0004, 0006, 0033, and 0037], and FIG. 2. In the example given in Minnick, 4 queues are defined within a group and the last 2 bits of the MAC address are examined and messages are placed into one of 4 queues. Minnick,

paragraph 0039, referring to FIG. 4. Further explanation and examples of this technique are provided by Minnick in paragraphs [0032-0034]. As is known by practitioners of ordinary skill in the art, MAC addresses consist of 6 bytes, or 48 bits. Each queue of Minnick contains packets that are sent to a large number of nodes, not only to the single "pre-defined destination node" as is defined by claim 2.

The Appellants assert that the processing of Minnick simply distributes among multiple queues data packets that are addressed to any of a large number of computing nodes. See, Minnick, paragraphs [0032-0034]. The Appellants assert that this is not a sufficient teaching of a "fast data queue," which is part of an "expedited transmission queue that is separate from a normal data packet queue," as is defined by claim 2, especially in the context of claim 1 from which it depends.

In the example given in the Minnick reference itself, segregating MAC addresses with 2^{48} possible values into 4 queues clearly equally allocates 2^{46} nodes to each queue. See, Minnick, FIG. 4 and paragraph 0035-0036 and 0039. The Appellants assert that it is clear and obvious that Minnick does not teach or suggest that "the fast data queue only queues data packets for transmission to the pre-defined destination node."

B. Whether claims 3 and 7 are unpatentable over Goldenberg et al. in view of Minnick et al. and in view of Snyder et al.

In the Examiner's Office Action of April 21, 2008, the Examiner rejected dependent claims 3 and 7 as being unpatentable over *Goldenberg et al.* (U. S. Patent Publication Number 2004/0034718) in view of *Minnick et al.* (U. S. Patent Publication Number 2003/0058878) and in view of *Snyder et al.* (U. S. Patent Number 5,522,039) (Hereinafter "Snyder"). The Appellants respectfully submit that claims 3 and 7 are not unpatentable over these references.

Rejection of Claim 3

With regards to the rejection of dependent claim 3, the Appellants assert that the Examiner has failed to properly cite a teaching of the first data packet and the second data packet having "a user data portion that is equal to a size of a cache buffer." Final Office Action, page 14, penultimate paragraph, citing Snyder column 5, lines 22-34, 62-65 and column 6, lines 7-10. The Examiner correctly characterizes the cited portion of Snyder as teaching a FIFO that is a twenty-two word memory and twenty-two words of data are quickly loaded into the FIFO. *Id.* However the Appellants assert that there is no teaching or suggestion in Snyder, taken either alone or in any combination with the other cited references, that "a user data portion is equal to" twenty-two words, as would be required to teach the limitation of claim 3 in the context of Snyder's twenty-two word FIFO.

Rejection of Claim 7

The Appellants assert that the Snyder reference fails to teach the "altering" limitation of claim 7.

The "altering" limitation of claim 7 states:

> altering the packet descriptor, after the loading the packet descriptor and while the packet descriptor is in the fast descriptor queue, so as to change the second destination node to be a remote destination node that is different than the pre-defined destination node

The Examiner's rejection of claim 7 clearly misconstrues the teaching of Snyder in an attempt to apply Snyder as a teaching of the limitations of claim 7.

To begin, the Examiner appears to cite portions of Snyder that discuss altering the "byte count" of packets as a teaching of "altering the packet descriptor" as defined by claim 7. Office Action dated April 21, 2008, page 15, penultimate paragraph. The Appellants point out that the "altering" limitation of claim 7 clearly and explicitly specifies the "altering the packet descriptor … so as to change the second destination node."

The Appellants assert that the plain language of claim 7 clearly requires altering the destination address of the packet of the system described by Snyder, and that altering the "byte count" cannot effectively "change the second destination node" as is specified by claim 7.

Not withstanding the inapplicability of adjusting packet "byte size" to the "altering" limitation of claim 7, the Appellants further traverse the implication of the Examiner's characterization of the Snyder reference that the sequence specified by the "altering" limitation of claim 7 is sufficiently taught by the teaching of Snyder that the control chip stores byte count and destination address information, and that "the byte count may be adjusted to take advantage of bimodal distribution." Office Action dated April 21, 2008, page 15, penultimate paragraph, citing Snyder, column 6, lines 38-41. That portion of Snyder goes on describe a "tradeoff" that is made in choosing an optimal value for the byte count to efficiently process both large and small packets and that such a tradeoff depends on the characteristics of the computing system and the network. Snyder, column 6, lines 41-48. The cited portion of Snyder also explicitly refers to the "bimodal distribution" described earlier in that reference. Snyder describes the "bimodal distribution" as packets that will be "very large" or "very small." Snyder, column 6, lines 16-27.

The Appellants assert that given the description of a "tradeoff" to be able to handle both large and small packets, and that the selection of an optimal value of the "byte count" value is dependent upon the computer system and network, it is clear that Snyder does not contemplate changing this "byte count" value on a packet-by-packet basis. The Appellants assert that any "adjustments" to "byte count" described in the cited portions of Snyder refer to adjusting "byte count" values as operating parameters made as part of a system configuration. The Appellants assert that Snyder never teaches, and clearly does not imply, that the adjustment to "byte count" be made in the sequence specified by the "altering" limitation of claim 7, i.e., "after the loading the packet descriptor and while the packet descriptor is in the fast descriptor queue."

Furthermore, the rejection of claim 1, from which claim 7 depends, cited the ‘network adapter’s cache” as a teaching of the queue containing packet descriptors. Office Action dated April 21, 2008, page 3, first paragraph. Snyder teaches the processor’s giving the address to the control chip directly so that the control chip can execute the transfer. Snyder column 8, lines 11-17. The only “altering” disclosed by Snyder is the direct giving of the address to the control chip, not a change to the “network adapter’s cache.” The Examiner then cites this same “giving” in Snyder as a teaching of the “reloading” limitation of claim 7. The Appellants assert that there is clearly and obviously no teaching or suggestion by the cited references of altering the contents of a “descriptor queue” to change a destination of a packet.

CONCLUSION

For the reasons stated above, the Appellant respectfully contends that the rejections of all appealed claims should be reversed, which reversal is courteously solicited.

Respectfully submitted,

Dated: November 20, 2008 By: /Jeffrey N. Giunta/
Jeffrey N. Giunta, Reg. No. 42,583
Attorney for Appellant

Fleit, Gibbons, Gutman, Bongini & Bianco PL
551 N.W. 77th Street, Suite 111
Boca Raton, FL 33487
Tel. (561) 989-9811
Fax (561) 989-9812

VIII. CLAIMS APPENDIX

1. A method, in a computer node, for transferring a data message, the method comprising:

identifying a pre-defined destination node, the pre-defined destination node being within a plurality of remote computer nodes to which data packets are able to be sent over a data communications network;

queuing, in an expedited transmission queue that is separate from a normal data packet queue, a first data packet that is addressed to the pre-defined destination node, wherein the normal data packet queue is used to queue data packets for transmission to other computing systems within the plurality of remote computer nodes, the other computing systems comprising destination nodes that are not the pre-defined destination node;

sending, through a communications adapter, the first data packet to the pre-defined destination node;

loading a packet descriptor associated with a second data packet into the communications adapter, wherein the loading is concurrent with the sending and the packet descriptor identifies a second destination node that is the pre-defined destination node; and

transferring, in dependence upon the packet descriptor, the second data packet to the second destination node over the data communications network.

2. The method according to claim 1, wherein the expedited transmission queue comprises a fast data queue, and wherein the sending of the first data packet and the transferring of the second data packet comprises loading the first data packet and the second data packet into the fast data queue, wherein the fast data queue only queues data packets for transmission to the pre-defined destination node over the data communications network.

3. The method according to claim 1, wherein at least one of the first data packet and the second data packet each comprise a user data portion that is equal to a size of a cache buffer.

4. The method according to claim 1, wherein the loading further comprises configuring, concurrently with the sending of the first data packet to the pre-defined destination node, the communications adapter for the transferring of the second data packet to the pre-defined destination node over the data communications network.

5. The method according to claim 1, wherein the expedited transmission queue comprises a fast data queue and a fast descriptor queue, and

wherein the loading comprises loading the packet descriptor into the fast descriptor queue for subsequent transfer to the communications adapter, and wherein the method further comprises loading the second data packet that is associated with the packet descriptor into the fast data queue.

6. (Cancelled)

7. The method according to claim 5, further comprising:

altering the packet descriptor, after the loading the packet descriptor and while the packet descriptor is in the fast descriptor queue, so as to change the second destination node to be a remote destination node that is different than the pre-defined destination node, and

reloading the packet descriptor into the communications adapter after the altering and prior to transferring the second data packet.

8. A computing node comprising:

a fast data element transmitter adapted to:

identify a pre-defined destination node, the pre-defined destination node being within a plurality of remote computer nodes to which data packets are able to be sent over a data communications network;

queue, in an expedited transmission queue that is separate from a normal data packet queue, a first data packet that is addressed to the pre-defined destination node, wherein the normal data packet queue is used to queue data packets for transmission to other computing systems within the plurality of remote computer nodes, the other computing systems comprising destination nodes that are not the pre-defined destination node;

send, through a communications adapter, the first data packet to the pre-defined destination node; and

a fast descriptor interface adapted to load a packet descriptor associated with a second data packet into the communications adapter concurrently with the sending of the first data packet by the fast data element transmitter, wherein the packet descriptor identifies the pre-defined destination and is used to configure the fast data packet transmitter for transferring a second data element, and

wherein the fast data element transmitter is further adapted to transfer, in dependence upon the packet descriptor, the second data packet to the second destination node over the data communications network.

9. The computing node according to claim 8, further comprising a fast data queue within the expedited transmission queue for queuing data elements for transmission to the pre-defined destination node, and

wherein the fast data element transmitter is further adapted to send the first data packet and transfer the second data packet by loading the first data packet and the second data packet into the fast data queue, wherein the fast data queue only queues data packets for transmission to the pre-defined destination node over the data communications network.

10. The computing node according to claim 8, wherein at least one of the first data packet and the second data packet each comprise a user data portion that is equal to a size of a cache buffer.

11. The computing node according to claim 8, wherein the pre-defined destination node is associated with a neighboring computer node.

12. The computing node according to claim 8, further comprising a fast descriptor queue within the expedited transmission queue for queuing the packet descriptor for subsequent transfer to the fast descriptor interface,

wherein the fast descriptor interface loads the packet descriptor into the fast descriptor queue for subsequent transfer to the communications adapter, and

wherein the fast data element transmitter loads the second data packet that is associated with the packet descriptor into the fast data queue.

13. (Cancelled)

14. A signal bearing medium tangibly encoded with a program which, when executed by a processor, performs operations for transferring a data message, the operations comprising:

identifying a pre-defined destination node, the pre-defined destination node being within a plurality of remote computer nodes to which data packets are able to be sent over a data communications network;

queuing, in an expedited transmission queue that is separate from a normal data packet queue, a first data packet that is addressed to the pre-defined destination node, wherein the normal data packet queue is used to queue data packets for transmission to other computing systems within the plurality of remote computer nodes, the other computing systems comprising destination nodes that are not the pre-defined destination node;

sending, through a communications adapter, the first data packet to the pre-defined destination node;

loading a packet descriptor associated with a second data packet into the communications adapter, wherein the loading is concurrent with the sending and the packet descriptor identifies a second destination node that is the pre-defined destination node; and

transferring, in dependence upon the packet descriptor, the second data packet to the second destination node over the data communications network.

15. The signal bearing medium of claim 14, wherein the expedited transmission queue comprises a fast data queue, and wherein the sending of the first data packet and the transferring of the second data packet comprises loading the first data packet and the second data packet into the fast data queue, wherein the fast data queue only queues data packets for transmission to the pre-defined destination node over the data communications network.

16. The signal bearing medium of claim 14, wherein each of at least one of the first data packet and the second data packet each comprise a user data portion that is equal to a size of a cache buffer.

17. The signal bearing medium of claim 14, wherein the loading further comprises configuring, concurrently with the sending of the first data packet to the pre-defined destination node, the communications adapter for the transferring of the second data packet to the pre-defined destination node over the data communications network.

18. The signal bearing medium of claim 14, wherein the expedited transmission queue comprises a fast data queue and a fast descriptor queue, and

wherein the loading operation comprises loading the packet descriptor into the fast descriptor queue for subsequent transfer to the communications adapter, and wherein the method further comprises loading the second data packet that is associated with the packet descriptor into the fast data queue.

19. (Cancelled)

20. The signal bearing medium of claim 18, wherein the operations further comprise altering the packet descriptor, after the loading the packet descriptor and while the packet descriptor is in the fast descriptor queue, so as to change the second destination

node to be a remote destination node that is different than the pre-defined destination node, and

reloading the packet descriptor into the communications adapter after the altering and prior to transferring the second data packet.

21. The method according to claim 1, where in the loading is performed prior to receiving a command to transfer data contained in the second data packet to the pre-defined destination.

22. The method according to claim 1, wherein the pre-defined destination is one of an adaptive nearest neighbor node within a cluster.

IX. EVIDENCE APPENDIX

NONE

X. RELATED PROCEEDINGS APPENDIX

NONE